INSTITUTE OF PUBLIC HEALTH

COLLEGE OF MEDICINE AND HEALTH SCIENCE

UNIVERSITY OF GONDAR

MASTER OF PUBLIC HEALTH

Prevalence of stunting and wasting and associated factors among children aged 6-59 months old at East Belesa woreda, Northwest Ethiopia, 2014.

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Approved by the Examining Board

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Abbreviations

GDP	Gross domestic product
NCHS	National Center of Health Statistics
SD	Standard Deviation
SPSS	Statistical package for social science
UNICEF	United Nation International Children and Education Fund
WHO	World Health Organization

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Abstract

Introduction: Nutritional disorders are among the main causes of morbidity and mortality. Stunting and wasting was one of the disorders that cause for many child deaths. Every minute of every day, four children die because of malnutrition in the World. Stunting and wasting varies from country to country and region to region depending on economic, ecological, social, and other factors. In Ethiopia at present the most serious nutritional problems are mainly due to low intake of food. High stunting and wasting rate in the country causes significant obstacle to achieving better child health outcome.

Objective: To assess prevalence of stunting and wasting and associated factors among children aged 6-59 months, in East Belesa, Northwest Ethiopia.

Method: A cross-sectional community based study design was conducted from April 1 to 16, 2014 in East Belesa. Multistage systematic sampling was used. A total of 633 from 6-59 month age children were assessed. Pre tested structured questionnaire and anthropometric measurement were used. Filled questionnaires was checked for completeness, cleaned manually, coded and entered in to EPI INFO version 3.5.3 statistical software and then transferred to SPSS windows version 20.0 for analysis. ENA for SMART 2011 software was used to convert nutritional data into Z-scores of the indices; Height-for-age, weight-for-height. The degree of association between independent and dependent variables was assessed by using odds ratio with 95% confidence interval and p-value.

Result The prevalence of stunting and wasting were 57.7 % and16% respectively.
The main associated factors of stunting were found to be child age, family monthly income, Child receive pre-lacteal feeds and age of mothers at first birth. Butter as a pre lacteal food was the only variable associated with wasting.

Conclusion The rural population of East Belesa, Ethiopia suffers from a high rate of stunting and wasting manifested primarily by stunting (height for age), reflecting a state of chronic malnutrition and wasting (weight for height) acute malnutrition. Therefore-especial attention should be given on intervention of stunting and wasting.

Key words: Stunting, Wasting, prevalence

1. Introduction

1.1. Statement of the problem

Nutritional disorders are among the main causes of morbidity and mortality. Stunting and wasting are the disorders that cripple global economic growth and development, Future global prosperity and security are intimately linked with our ability to respond adequately to this urgent challenge [1]. Malnutrition in children typically develops during the period from 6 to 18 months of age, when growth velocity and brain development are especially high [2].

Every minute four children die because of malnutrition. Of those children that survive, one in four is stunted in the world and four in every 10 children in sub-Saharan Africa are stunted because of lack of nutritious food. That is a total of more than 56 million children [3].

Stunting and wasting varies from country to country and region to region depending on economic, ecological, social, and other factors. In Ethiopia at present the most serious nutritional problems are mainly due to low intake of foods. The overall prevalence of malnutrition in the community of Gumbrit, Northwest Ethiopia was 24% stunted and 17.7% wasted [4]. Undernutrition among children in Tigray region, 46.9%, stunted and 11.6% was wasted. Stunting increases from 16% in the second half of the first year to 53% in children 24 months and older. Child age, maternal anthropometric characteristics, inadequate complementary foods, the use of prelacteal feeds and area of residence were the main contributing factors to child Undernutrition [5]. In Asaita district of Afar region were the highest prevalence of stunting 67% and wasting 12.8% [6].

According to the 2011 Ethiopia Demographic and Health Survey macronutrient deficiency is a major problem countrywide, and stunting, and wasting, are 44%, and 10%, respectively in children under five years of age. Whereas, 21 % of children are severely stunted. In Amhara region 52% and 10% of under five children were stunted and wasted respectively. Stunting is the highest in this region compared to other regions. The lowest was 22% in Addis Ababa [7].

Annual costs associated with child Undernutrition are estimated at Ethiopian birr (ETB) 55.5 billion, which is equivalent to 16.5% of GDP [8].

This study emphasize on wasting and stunting. Because wasting describes current nutritional status. It reflecting acute or recent nutritional deficit. Stunting is the measure of linear growth. It is a condition reflecting the cumulative effect of chronic malnutrition. But underweight does not distinguish between acute malnutrition (wasting) and chronic malnutrition (stunting) as well as it is difficult to interpret. For instance if a child is underweight he/she was stunted, wasted or both. [7, 8]. Young children are particularly susceptible to malnutrition if complementary foods are of low nutrient density and have low bioavailability of micronutrients. In addition, children's nutritional status will be further compromised if complementary foods are introduced too early or too late, or/and contaminated. Low dietary intakes, infectious diseases, lack of appropriate care, and inequitable distribution of food within the household also considered as a factor. In communities that have little access to contact with health care are more vulnerable to malnutrition as a consequence of inadequate treatment of common illnesses, low immunization rates, and poor antenatal care [2].

East Belesa Woreda is food insecure, due to this reason different intervention like social safety net program and community based nutrition applied to tackle the nutritional problem. Activities during community based nutrition are growth monitoring monthly, screening of pregnant/lactating mother and children 6 to 59 months every three month and supplementation of vitamin A and de-worming every six month. So this study will be important in determining the nutritional status (stunting, and wasting) and its associated factors as well as it was suggest further possible interventions in children of East Belessa woreda.

1.2. Literature Review

1.2.1. Magnitude of stunting and wasting:

Malnutrition refers to a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients. It remains one of the most common causes of morbidity and mortality among children under five throughout the World [9] Stunting, wasting and other forms of Undernutrition are clearly a major contributing factor to child mortality, morbidity and disability. For example, a severely stunted child faces four times higher risk of dying, and a severely wasted child is at nine times higher risk. The broader understanding of the devastating consequences of Undernutrition on morbidity and mortality is based on well-established evidence [10].

Globally, about one in four children under 5 years old are stunted (26 per cent in 2011). An estimated 80 per cent of the world's 165 million stunted children live in just 14 countries and wasting affected at least 52 million children. Indeed, sub-Saharan Africa is the only region that has seen an increase in absolute numbers of stunted children over the past 20 years that is more than 56 million children. In Ethiopia 44% and 10% of children were stunted and wasted respectively. In the case of Amhara region, it is 52% and10% respectively. Stunting, wasting and other forms of Undernutrition reduce a child's chance of survival, while also hindering optimal health and growth. Stunting is associated with suboptimal brain development, which is likely to have long-lasting harmful consequences for cognitive ability, school performance and future earnings. This in turn affects the development potential of nations [3, 7, 10, 11].

Out of the 556 million children under 5 years in low-income countries, 32% (178 million) were stunted. Stunting contributes to child mortality and disease burden. Of the almost 10 million deaths annually among children below 5 years of age, it was estimated that the attributable fraction of stunting was15% [12].

A community-based cross-sectional study conducted in Informal Urban Settlement in Nairobi, Kenya although revealed that, the prevalence of stunting and wasting were

47.0%, and 2.6%, In addition, the prevalence of malnutrition by its level of severity indicated that 23.4% were severely stunted, and 0.6% were severely wasted. [13].

Study done on malnutrition among under-five children in Dollo Ado district, Somali region revealed that, prevalence of stunting and wasting on under-five children was 34.4% and 42.3%, respectively [14]. The other study in East rural Ethiopia show that the prevalence of acute child Undernutrition was 7.4%; 95% CI: (6.3%, 8.5%) in wet and 11. 2%; 95% CI: (9.8%, 12.5%) in dry seasons. [15].

Study conducted in the respective country show that the prevalence levels of wasting are high among refugee children in Ethiopia (14.9%) and Malaysia (13.5%), and medium in Iraq (6.1%), Kenya (9.0%) and Thailand (6.4%). Jordan (3.5%) and Nepal (4.7%) show relatively low levels of wasting or acute malnutrition in refugee children. The prevalence levels of stunting are high in Thailand (39.0%); medium in Ethiopia (28.4%) and Kenya (20.5%); and low in Iraq (13.3%), Jordan (4.1%), Malaysia (7.8%) and Nepal (17.1%) [16].

A community-based cross-sectional study conducted in Gunbrit, Northwest Ethiopia although revealed that, the prevalence of stunting and wasting was 24% and 17.7%. The other study on Prevalence and Determinants of Malnutrition among Pre-School Children in Northern Nigeria show that the prevalence of stunting was 44.9%, and wasting 3.7%. [4, 17].The other study also conducted on Household Food Insecurity Associated with Higher Child Under nutrition in Bangladesh, Ethiopia, and Vietnam, revealed that The prevalence's of HFI were 66%, 40%, and 32% in Ethiopia, Vietnam, and Bangladesh, respectively. The prevalence's of stunting and wasting were higher in Bangladesh (47.1% and 19.1%, respectively) and Ethiopia (50.7 and 5.9%,) than in Vietnam (20.7% and 5%,) [18].

1.2.2. Factors associated with stunting and wasting

There is a complex set of determinants for stunting and wasting. Inadequate and/or inappropriate dietary intake and infectious disease are the immediate causes while these in turn are related to a number of factors such as socio-economic and demographic, child health and care, maternal and environmental factors [19].

Socio-economic and demographic factors

Study done in East rural part of Ethiopia show that Child wasting was more common among children of poor households who had no cooperative bank saving accounts [AOR (95% CI) = 8.2. (1.8, 37.6)], and access to health facilities [AOR (95% CI) = 2.2 (1.4, 3.6)] [15]

Study conducted on Nutritional Status of Children under Five Years of Age in Nepal show that the socioeconomic status was most important factors associated with stunting and wasting. The risk of stunting increases with age. other study conducted on malnutrition among under five children in Ludhiana, Punjab reveal children with >3 siblings, female children, children aged 48-59 months, observed to be at the highest risk of being undernourished[20, 21].

Among the socio-economic variables included in the study rural locality of Gumbrit, Northwest Ethiopia only family income was significantly associated with malnutrition. The other study on Household food insecurity and nutritional status of children in Kailali District of Nepal there were no significant associations between household food insecurity and stunting [4, 22].

Child Factor

Study conducted on Nairobi, Kenya show that Boys were more stunted than girls ($p<0.01$), and older children were significantly ($p<0.0001$) stunted compared to younger children. In the third year of life, girls were more likely than boys to be wasted ($p<0.01$). The other study conducted among Beta-Israel communities also show that the main contributing factors for under-five malnutrition were found to be sex of the child, child's age, diarrhea episode, deprivation of colostrums, duration of breastfeeding, pre-lacteal feeds, type of food, age of introduction of complementary feeding and method of feeding [13, 23].

Study conducted among under five children in Sukkur Pakistan, the common risk factors associated with severe acute malnutrition were large family size, non exclusive breast feeding and recurrent diarrhea parental illiteracy, poverty [24].

A study on determinants of stunting in children under five years of age in food surplus region of Gojam, Ethiopia indicated that the main contributing factors for under-five stunting were found to be sex of the child, child's age, diarrhea episode, deprivation of colostrums, duration of breastfeeding, pre-lacteal feeds, type of food, age of introduction of complementary feeding and method of feeding [25].

Maternal and Child caring factor

Study conducted in Rupandehi District of Nepal more than half of the children (57.75%) were under nourished who were born from mother aged less than 18 years of age where as 75% were under nourished who were born mothers aged greater than 35 years of age. A study conducted in Lao People Democratic Republic show that Level of education of parents, attitudes of mother, assets of household, and local health services were considered to be important determinants of nutritional status of children [26, 27].

A study conducted to assess the feeding patterns and stunting during early childhood in rural communities of Sidama, South Ethiopia show that women who did not receive antenatal care (ANC) during pregnancy were 1.5 times more likely to practice pre-lacteal feeding and 2.8 and 1.9 times more likely to feed their children below minimum dietary diversity and minimum meal frequency, respectively (P=0.01). Mothers older than 18 years during the birth of the first child were 86% less likely to feed their child below minimum meal frequency than their younger counterparts (P=0.01). Children who started complementary food either before or after the recommended 6 months time, were more likely to be stunted (P=0.01) [28].

Study done in Rupandehi District of Nepal the association between age of the mother at the birth of the child and nutritional status is not statistically significant [26]

A community based study in Somali region indicated that the significant determinants of malnutrition were marital status, maternal education, decision making, presence of ARI, total number of children ever born, health status during pregnancy, pre-lactation practice, mode of feeding [14]

Environmental factor

Infants and children can be exposed to food contaminants through lack of access to clean water, type of floor in the households, infant formula, and complementary foods are subjected to the food safety problems and exposed to malnutrition [14, 29].

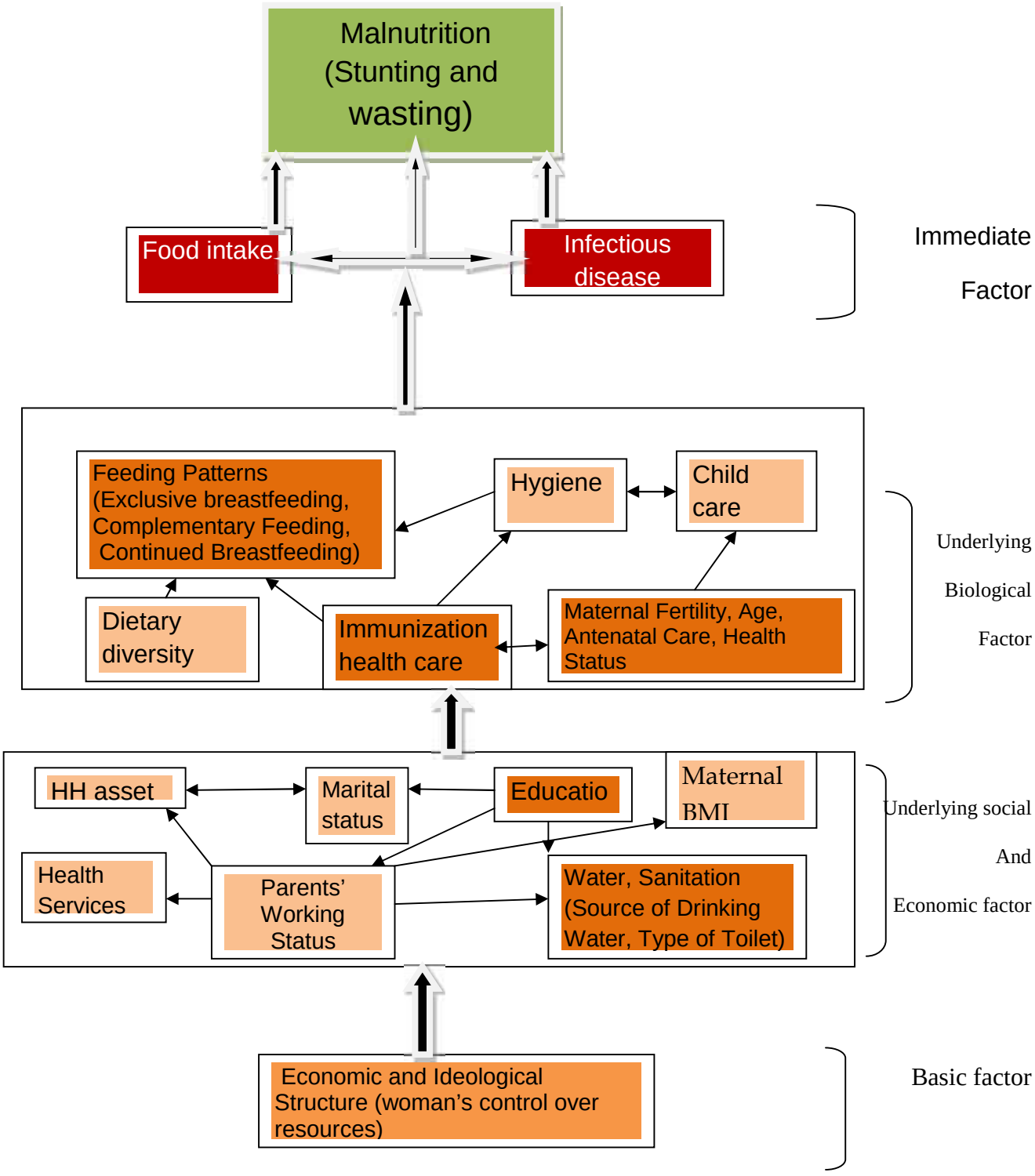


Fig.1. conceptual framework for stunting and wasting

Source; Adapted from: UNICEF [30]

1.3. Justification of the proposed study

Malnutrition is the major cause of under five Morbidity and Mortality. Because children are the most vulnerable segment of the population especially those 6-59 months of age [11].

Stunting is chronic form of malnutrition. That is why this study is very essential to determine the prevalence of stunting in this chronically food in secured area. If a child is stunted low school performance, decrease productivity and negative effect on economic development [8].

Wasting: a consequence of acute shortage of food and/or severe disease. The risk of stunting and wasting increase with decreasing in socio-economic development. Factors that are contributing to malnutrition vary from country to country even district to district. So identifying the underlying causes of malnutrition in a particular locality is important approach for proper priority setting.

Study conducted in other districts was not addressed the main associated factors of malnutrition.

The study area is chronically food insecure and supported by social safety net program as well as community based nutrition. Even if numerous efforts have been tried, the problem is not improved. So, this study will serve as evidence and to show the magnitude of stunting and wasting as well as factors associated with it.

Therefore findings of this study are expected to provide base line data for policy and program designers to design evidence based nutritional interventions. And it was help for Woreda health office to strengthen community based nutrition and to allocate scarce resources efficiently based on the evidence.

The finding of the study was also used as base line data for further studies.

2. Objectives

2.1. General Objective

- To assess the magnitude of stunting and wasting and associated factors among children aged 6 to 59 months old in East Belesa district, Northwest Ethiopia, 2014.

2.2. Specific objectives

- To determine prevalence of stunting in children aged 6-59 months
- To describe prevalence of wasting in children aged 6-59 months
- To identify associated factors of stunting in children aged 6-59 months
- To identify associated factors of wasting in children aged 6-59 months

3. METHODS

3.1. **Study design**

A community based cross-sectional study design was conducted to assess the undernutrition (stunting and wasting) and associated factors among children aged 6-59 months in the study area.

3.2. **Study area and period**

The study was conducted in East Belesa Woreda, North Gondar Zone from April 1 to 16, 2014. According to the 2012/13 East Belesa District Finance and Economic Development office annual statistical report, a total population of about 111,687, out of which 16,356 are under five children. From the total population 94,167(84%) urban and 17,520 (16%) are rural inhabitants. Gohala is the Woreda capital of East Belesa found 768 Km, Northwest of Addis Ababa [31].

The climate of East Belesa Woreda is 90% Kola and 10% Woinadega with minimal rain fall in a year. Its altitude ranges between 1,496 to 2,000 meter above sea-level. The area was repeatedly attacked by drought and famine. The main ethnic group in the Woreda was Amhara. The population depends on farming. The main agricultural products are 'teff', bean, sorghum and wheat. The main staple food is of cereal origin. The health institutions found in the district are five health center, twenty two health posts and one hospital under construction [31].

3.3. Source population and Study population

3.3.1. Source population

The source population of this study was all children aged 6-59 months in East Belesa Woreda.

3.3.2. Study population

The study population was children 6- 59 months of age living in the district kebele randomly included in the study that fulfill the inclusion criteria.

3.4. Inclusion and exclusion criteria

3.4.1 Inclusion criteria:

Children 6 to 59 months of age and Mothers/care takers who resided in the area.

3.4.2 Exclusion criteria:

Critically sick and grossly deformed child, mothers/care takers with mental illnesses, communication problems or other severe conditions and the presence of eligible children from the selected household but not available during the data collection after repeated visit.

3.5. Sample size and Sampling procedure

3.5.1. Sample size determination

Sample size is determined using the formula for single population proportion, by taking the following assumptions in to consideration.

Z= 1.96 with 95% CI

d= 0.05

Design effect=1.5

Non response rate= 10%,

$$n = \frac{(Z\ \alpha/2)^2\ P\ (1-P)}{d^2}$$

Indicator	proportion	Sample size
stunting	52%	384
wasting	10%	138

Table1. Sample size calculation by objectives.

Based on the prevalence of stunting and wasting in Amhara Regional state (shown in table 1) calculate sample size for each objective and select the highest. It was 384, [7]. So with adjustment for non-response (10% contingency) n= (384+38) =422, and again multiplied by design effect 1.5, the final sample size was **633**.

3.5.2. Sampling procedures

Multi-stage sampling technique was employed. From all 20 rural Kebele's 5 was selected by simple random sampling technique. Individual households in the selected Kebele were selected using a systematic random sampling technique and the numbers of households sampled from the selected Kebele was determined using proportionate-to-population size. The study subject in the selected household was interviewed and measurement of anthropometric indices was done. For households with more than one study subject, only one was selected using lottery method. If the selected household (HH) was closed during data collection, but if it was known that there were eligible children, the interviewers revisit the HH three times at different time intervals and when interviewers failed to get that HH open or if the eligible children from the selected household was not available during the data collection, the household was excluded from the survey and replaced by the next nearest HH.

Key

$$nk = \frac{Nk*n}{N}$$

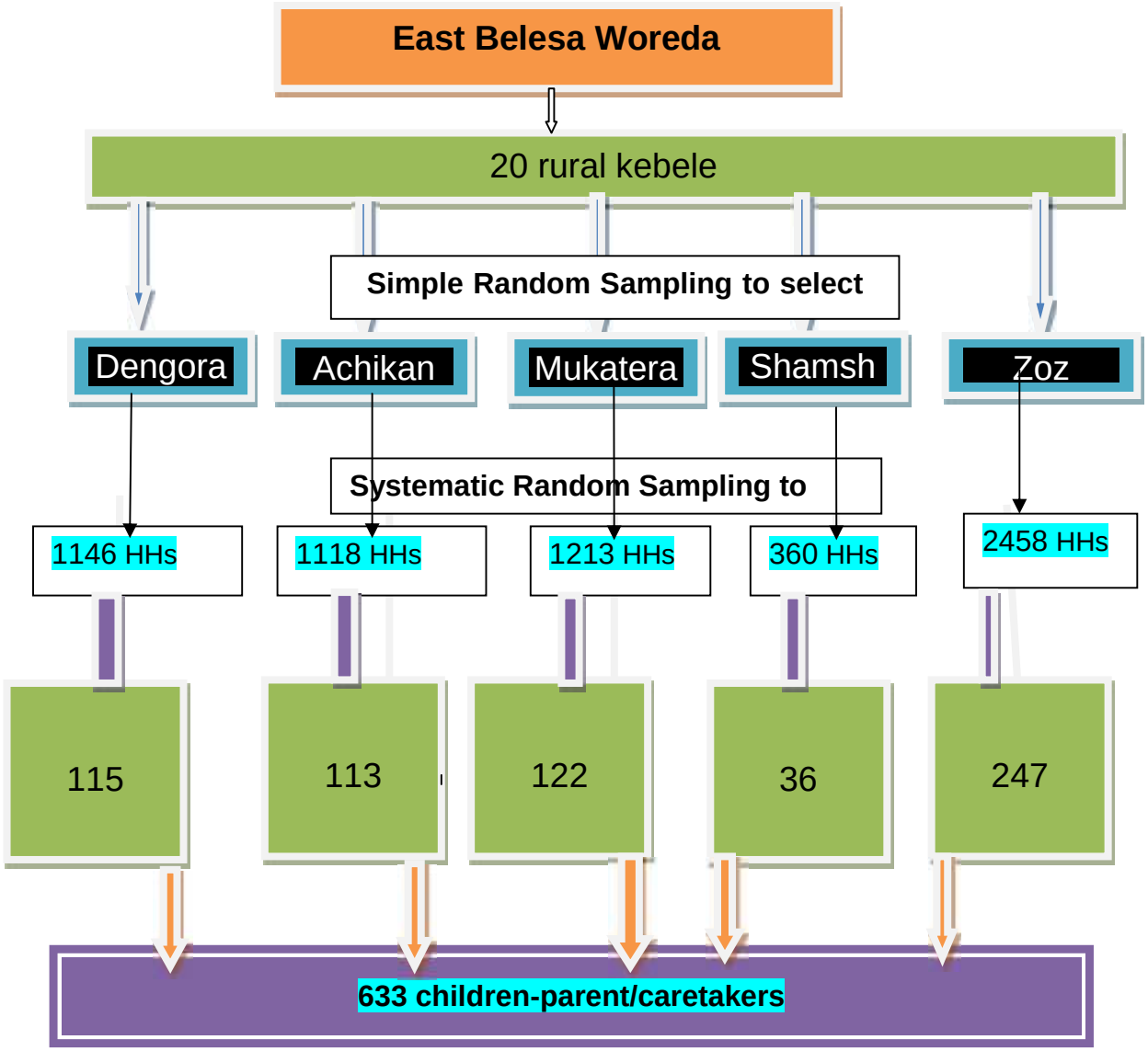
nk= number of sample for each kebele by proportionate allocation

n= Sample size of study/633/

NK= total number of Household/study participants in each selected kebele

N= total number of HHs (6295)

Fig.2. Schematic presentation of sampling procedure (sorry for citation)



3.6. Variables of the study

3.6.1. Dependent variables

Malnutrition (Stunting and Wasting)

3.6.2. Independent variables

Socio-economic and demographic variables; Head of HHs, marital status, ethnicity, religion, family size, HH food security status, income, education ,occupation, ownership of livestock and farm land, Dietary intake.

Child characteristics; Age, Sex, birth weight, birth interval, birth order, place of delivery, gestational age, number of birth, early initiation, exclusive and continuation of breastfeeding and morbidly status (fever, measles, diarrhea and ARI).

Maternal and Child caring practices; age, number of children ever born, ANC visits, health status during pregnancy, use of extra food during pregnancy and lactation, autonomy in decision-making on use of money, child Feeding, level of dietary diversity, hygiene, health care seeking and immunization.

Environmental Health condition; Water supply, sanitation and housing condition.

3.7. Operational definitions

Malnourished: A child was labeled as malnourished if any of the nutritional assessment indices weight for height, or height for age is below -2 SD of the median of the standard curve.

Wasting: weight-for-height below-2SD from the WHO median value. Nutritional deficient state of recent onset related to sudden food deprivation or mal-absorption utilization of nutrients which results weight loss,

Stunting: A child was defined as stunted if the height for age index was found to be below -2 SD of the median of the standard curve [32].

Diarrhea: Diarrhea is defined for a child having three or more loose or watery stools per day

3.8. Data collection instruments and procedures

Data was collected using structured questionnaire and anthropometric measurement tools. The questionnaire was first prepared in English then translated to Amharic then back to English and data was collected by interviewing and measuring anthropometric indices. Ten data collectors who able to communicate in Amharic was recruited from health centers and health posts in the woreda. Training was provided for data collectors and supervisor for two days. Interview was conducted with mothers/care takers of the children to fill the questionnaire by nurses. In HHs with more than one children of age between 6-59 months, one child was select randomly by lottery method.

Anthropometric data: The anthropometric data was collected using the procedure stipulated by the WHO (2006) for taking anthropometric measurements. Before taking anthropometric data for children; their age should first determine in order to ensure the target population. A local event was use to establish the birth period. If age cannot be determined accurately a height of 65-110 cm is considered as proxy indicators [32].

Height/length measurement: Body length of children age up to 23 months were measured without shoes and the height was read to the nearest 0.1cm by using a horizontal wooden length board with the infant in recumbent position. However, height of children 24 months and above was measured using a vertical wooden height board by placing the child on the measuring board, and child standing upright in the middle of board.

Weight measurement: Weight was measured by electronic digital weight scale with minimum/lightly/clothing and no shoes. Calibration was done before weighing each child by setting it to zero. In case of children age below two years, the scale was allowed to weight very young children through an automatic mother-child adjustment that is eliminated the mother's weight while she stands on the scale with her baby.

Oedema was checked and noted on data sheet because a child with oedema was severely malnourished. In order to determine the presence of oedema, normal thumb pressure was applied to the two feet for three seconds whether a shallow print or pint remains on both feet when the thumb was lifted.

To identify retrospective morbidity of children, mothers were asked about any occurrence of illness during the past two weeks and one year for measles.

3.9. Data Quality control

To ensure data quality a pre-tested structured questionnaire was used. Training was given for the data collectors and supervisors. Pre-test of the questionnaire was done on 5% (32) of sample size in similar area which was not included in study before the actual data collection. EPI info was used for data entry to control the quality of the data. Data quality was managed by appropriate supervision of data collectors. Overall supervision was made by the principal investigator and the scale indicators were checked against zero reading before weighing each child.

3.10. Data processing and analysis

Code was given to the completed and consistent questionnaire, cleaned manually and then data was entered using EPI info version 3.5.3 statistical soft ware. and then sex, age, height and weight transferred with edema to ENA for SMART 2011 software to convert nutritional data into Z-scores of the indices; H/A, and W/H using reference WHO standard. Analyzed using SPSS version 20 statistical package. Frequencies and cross tabulation was used to summarize descriptive statistics of the data and tables and graphs was used for data presentation. Bivariate analysis was used primarily to check which variables have association with the dependent variable individually. Variables found to have association with the dependent variables (p. value<0.2) was entered in to multivariate analysis for controlling the possible effect of confounders and finally the variables which have significant association was identified on the basis of OR, with 95%CI and p-value. Those variables with p-value of less than 0.05 in the multivariate analysis were considered as significant.

3.11. Ethical considerations

Ethical clearance was obtained from the Ethical review board of University of Gondar. Communication with the District and different Kebele administrators was made through formal letter obtained from the University of Gondar and North Gondar Zonal health department. After the purpose and objective of the study had been informed, Verbal consent from parents/care taker of study subjects was obtained. Participants were also informed that participation on voluntary basis and they can withdraw, refuse or completely reject from the study at any time if they are not comfortable. In order to keep confidentiality of any information provided by study subjects, the data collection procedure was anonymous. For children who were found to be sick during the time of data collection medical advice and urgent referral was arranged.

3. 12. Dissemination of results

High priority was given to the timely submission and dissemination of the study findings to Institutes of public health, College of Medicine and Health Sciences, University of Gondar, East Belesa Woreda Health office, North Gondar zone health Department, and Amhara regional health bureau. An attempt was made to present the findings in different conferences and workshops and sent to publication on scientific journal.

4. Results

Demographic and Socio-Economic Characteristics

From the total 633 study subjects, 100% had complete response.

Majority of respondents were Amhara ethnic group 98.3% and 97.5% were Orthodox. Out of the respondents, 40.8%had five and above total family size while 39.5% of households have one to two under five years children.

Concerning educational status, 87.7% of mothers and 47.9% of fathers cannot read and write. About 94.9%of mothers and 96.1% fathers were farmer. Out of the total, 72% of households earn monthly income of less than 750birr and 57.5% of them were decision making on use of money made by mainly husband.

Table 2. Demographic and socio-economic characteristics of children families at East Belessa woreda, Northwest Ethiopia 2014 (N=633)

Varibles	Frequency	Percent
Head of HH		
male	585	92.4
female	48	7.6
Marital status		
Married	585	92.4
Single	17	2.7
Other *	31	4.9
Religion		
Orthodox	617	97.5
Muslim	16	2.5
Ethnicity		
Amhara	622	98.3
Agew	11	1.7
Total family size		
<5	375	59.2
≥ 5	258	40.8
Under five children in the HH		
1	383	60.5
2-3	250	39.5
Maternal education		
Can't read and write	555	87.7
Can read and write(Informal)	43	6.8
Primary education	28	4.4
Other **	7	1.1.
Paternal education		
Can't read and write		

Can read and	303	47.9
write(Informal)	183	28.9
Primary education	100	15.8
Other **	18	2.8
Occupation of mother		
Housewife only	601	94.9
Student	12	1.9
Merchant/Trade	11	1.7
Government employee	9	1.4
occupation of father		
Farmer	580	96.1
other ***	24	3.9
Monthly income of the HH ETB		
<750	456	72.0
750-1000	134	21.2
>1000	43	6.8
Decision making on use of money		
Mainly spouse	48	2.6
Mainly husband	365	57.7
Only husband	70	11.1
Both jointly	150	23.7
Livestock		
Yes	521	82.3
No	112	17.7
HHs supported by safety net program		
Yes	**81**	**12.8**
No	**552**	**87.2**

Other* =Widowed, Divorced other **=Secondary, Higher other*student, Merchant, government employee**

Characteristics and Caring Practices of Children

Among the total children aged 6-59 months 53.6% were Male, and 28.1% were found in the age groups of 12-23, months. The mean age of children was 26.5 with SD of ±14.4

From the total children 87.8%, were delivered at home, out of which 6.3% were preterm. Regarding breastfeeding status, Breastfeeding was very common in my study area, all mothers had been ever breast breastfed the child and 24.5% of them were less than 12 months

From the common childhood illness, 26.1% of children had diarrhea in last two weeks before the day of the survey. Out of children who had diarrhea, 10.4% of children had 2 episode of diarrhea per year. And Also, 18.5%, 15.2% and 11.8% of children had fever, ARI and measles, respectively (Table 3).

Table3. Characteristics and Caring Practices of Children from 6-59 months in East Belessa Woreda Northwest Ethiopia 2014.

Variable	Frequency	Percent
Child sex		
Male	339	53.6
Female	294	46.4
Child's age in month		
6-11	107	16.9
12-23	178	28.1
24-35	138	21.8
36-47	118	18.6
48-59	92	14.5
Place of delivery		
Home	556	87.8
Health institution	77	12.2
Gestational age at birth		
<9 month	40	6.3
At 9 month	539	85.2
>9 month	54	8.5
child ever been immunized		
Yes	547	86.4
No	86	13.6
Vit. A supplementation in the past six months		
Yes	429	67.8
No	204	32.2
Diarrhea		
Yes	165	26.1
No	465	73.9
Episode of diarrhea		
One	41	6.5
Two	66	10.4
3-4	51	8.1
>=5	15	2.4
Fever		
Yes	117	18.5
No	516	81.5
ARI		
Yes	96	15.2
No	537	84.8
Measles		
Yes	75	11.8
No	558	88.2

CHILD CARING PRACTICE AND MATERNAL CHARACTERSTICS:

From the total children, 72.4% were initiated breastfeeding practice immediately after birth (within one hour). In addition to initiation of breastfeeding practice, 58.7% children were received pre lactation of food or fluids. Out of which 72.6% use butter as a pre lacteal food/fluid.

Regarding methods of feeding, majority of children who were started complementary feeding by cup 49.9%. The mean and standard deviation of mothers age were 29(± 6.9SD) years and mean and standard deviation of mothers age at first birth were 17.9(± 2.SD). Majority 52.9% and 70.1% of mothers were in age group between 20-29 year and gave first birth between 15-19years of age Respectively (Table 3).

Table4. CHILD CARING PRACTICE AND MATERNAL CHARACTERSTICS in East Belessa Woreda Northwest 2014.

Variables	Frequency	Percent
First put the child on BF		
Immediately	458	72.4
1-24 hour	156	24.6
After 1 day	19	3.0
Child received pre-lactation Food/fluid?		
Yes	372	58.7
No	261	41.3
Kind of pre-lactation Food/fluid?		
Water	102	27.4
Butter	270	72.6
feeding colostrums		
Yes	410	64.8
No	223	35.2
Age complementary food started		
<4	45	7.6
4-5	60	10.1
6	329	55.5
>=7	159	26.8
Complementary food last 24 hour in addition to BF		
Yes	593	93.7
No	40	6.3
Frequency of feeding		
<3 times	336	58.7
3 times	152	26.6
>3 times	84	14.6
Method of feeding		
Bottle	19	3.3
Cup	284	49.9
Spoon	73	12.8
By hand	193	33.7

duration of BF		
<12 mont	155	24.5
12-24 month	223	35.2
>24 month	255	40.3
Mother's age in years		
15-19	31	4.9
20-29	335	52.9
30-39	205	32.4
40-49	57	9.0
>49	5	0.8
Age at first birth		
<15	63	10
15-19	444	70.1
20-29	126	19.9
Total number of children ever born?		
1-3	372	58.8
4-6	226	35.7
>6	35	5.5
Extra food during pregnancy or lactation		
		31.6
yes	200	68.4
no	433	
Did you visited health facility for ANC		
Yes	182	28.8
No	457	71.2
family planning used currently		
Yes	140	22.1
No	493	77.9
Type of family planning		
Depo-Provera	131	20.7
Other *****	35	5.5

Other*** =** pills,norplant and calendar method

Environmental Health Characteristics of Households

Regarding the sources of drinking water, about 36.3% and 22.9% of households used unprotected spring and public tap water, respectively. (Table 5).

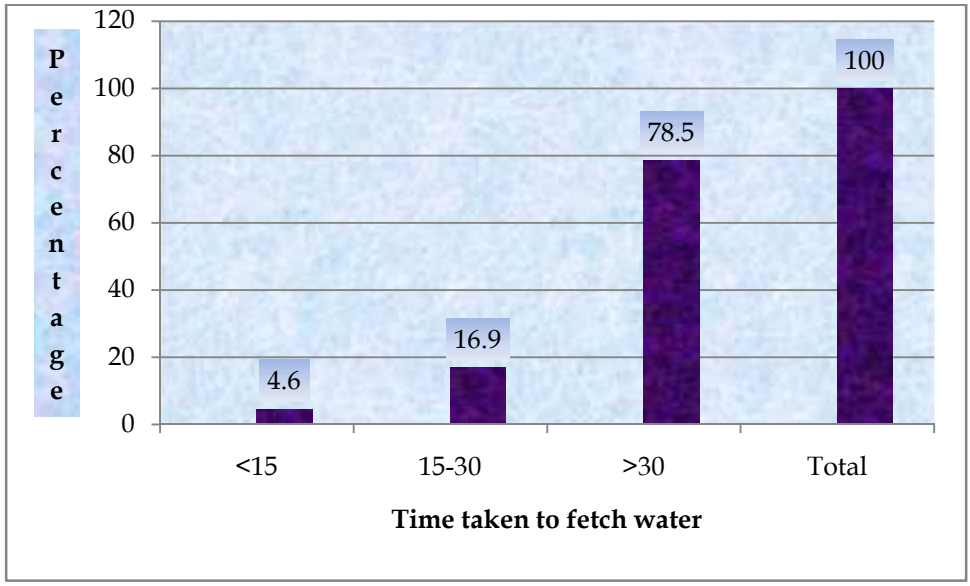


Fig 3. Time taken to fetch drinking water in minute (round trip) at East Belesa Woreda, Northwest Ethiopia, 2014.

Regarding treating drinking water in households, majority of HHs (83.6%) did not treat water by any means. From all respondents 39.2% of HHs had latrine and all of them were pit latrine. Regarding waste disposal system, 70.5% dispose garbage in open field.

Table5. Environmental health characteristics in East Belesa Woreda Northwest Ethiopia 2014.

Variables	**Frequency**	**Percent**
source of drinking water		
River	138	21.8
Un protected spring	120	19
Protected spring	230	36.3
Public tap	145	22.9
Water used in HH per day by liters		
<40	368	58.1
40-80	256	40.4
>80	9	1.5
Time to fetch drinking water (round trip minute)		
<15	29	4.6
15-30	107	16.9
>30	497	78.5
HHs treat water by any means		
Yes	104	16.4
No	529	83.6
Method of garbage disposal of HHs		
Open field disposal.	446	70.5
Common pit	100	15.8
Other [a]	87	13.7
Availability of latrine		
Yes	248	39.2
No	385	60.8
Type of House		
thatched	535	84.5
Corrugated Iron Sheet	98	15.5

[a] burning, composting

Prevalence of stunting and wasting among Children Aged 6-59 Months

The overall prevalence of stunting and wasting among children aged 6-59 month were 57.7 % and 16% respectively. The highest prevalence of stunting was found in male whereas wasting in female (Figure 4).

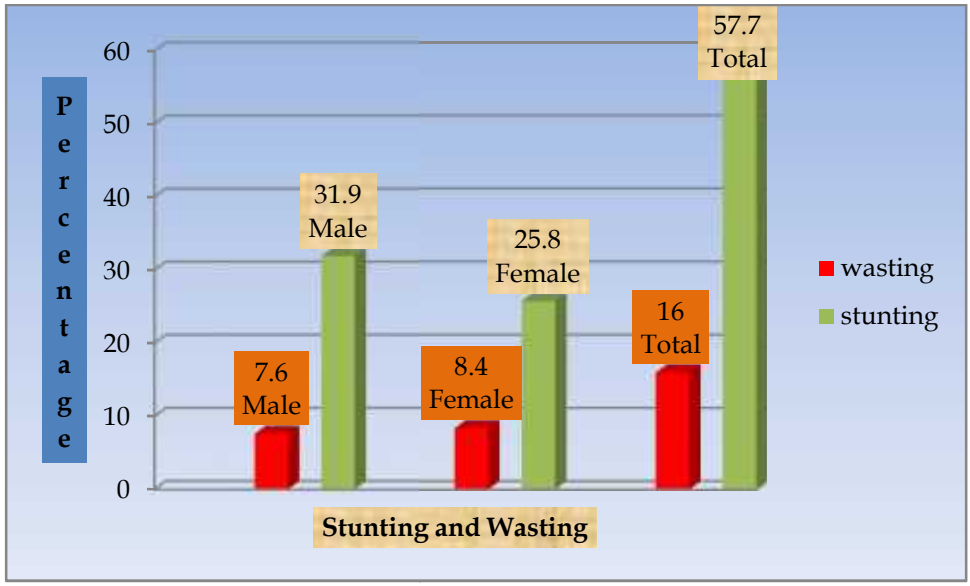


Fig4. Distribution of stunting and wasting among children aged 6-59 months by sex at East Belesa Woreda, Northwest Ethiopia, 2014.

To compared stunting with age groups, the highest prevalence of stunting was children age 12-23 months followed by children aged 24-35 month. However, the lowest prevalence of stunting was seen in children aged 48-59 months (Figure 5).

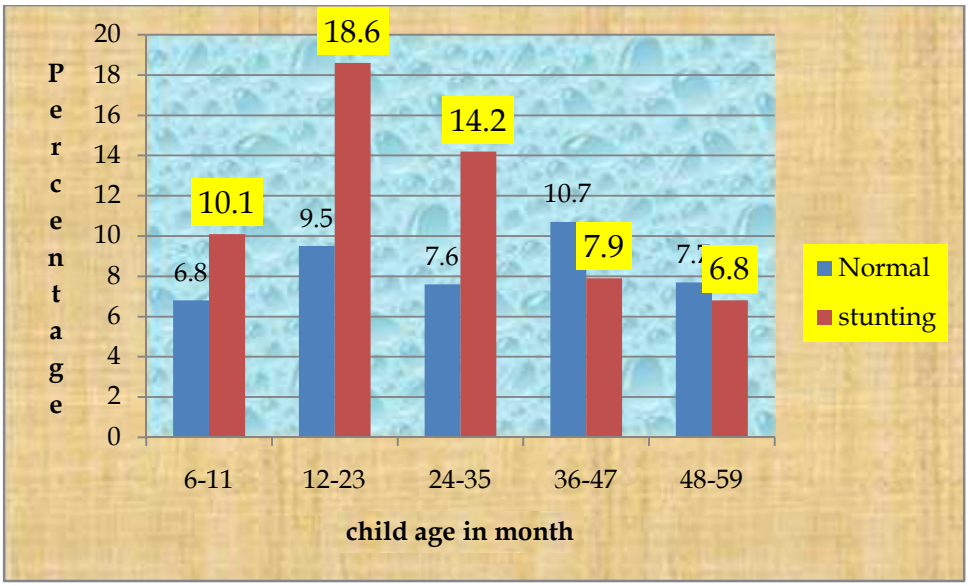


Fig.5. Prevalence of stunting by age among children aged 6-59 months at East Belesa Woreda, Northwest Ethiopia, 2014.

Regarding prevalence of, The highest and lowest prevalence of was seen children aged 12- 23 and 6-11 months respectively in East Belessa Woreda (Figure 6).

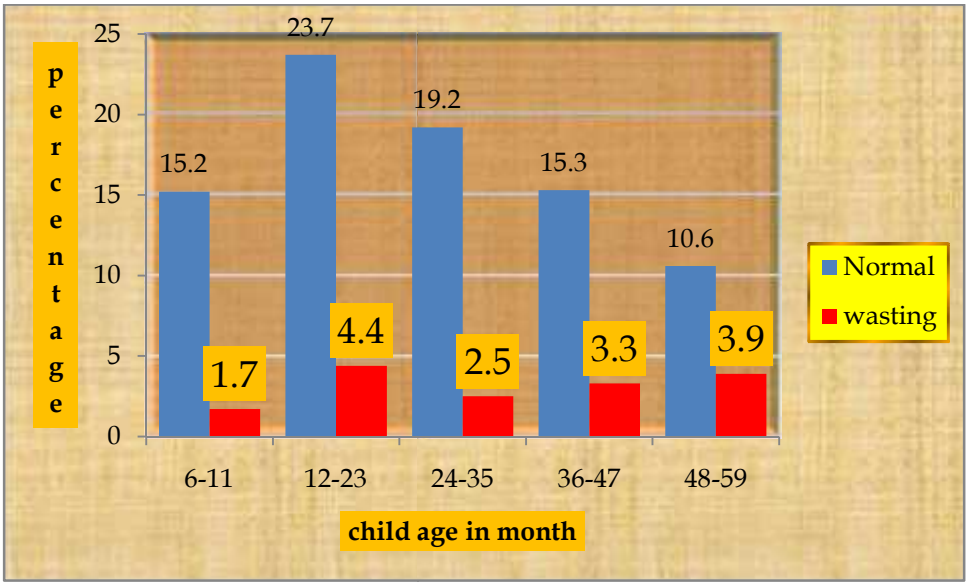


Figure 6.Prevalence of wasting by age among children aged 6-59 months at East Belesa, Ethiopia 2014.

Factors Associated with stunting and wasting

Factors associated with stunting, bivariate results

A bivariate analysis was performed and the results were displayed in Table 6. This study examined the influences of demographic and socio-economic factors, child factor, maternal and child caring factor, environmental health factors on the risk of stunting.

Findings from the bivariate analysis show that of the association between stunting and child age, Family monthly income, ANC visit, Total family size, mother's age at first birth and children who were received pre-lacteal were significantly associated with stunting.

But after controlling for possible confounders, the result of multivariate analysis reveals that only child age, family monthly income, mother's age at first birth and pre-lacteal feeding was significantly associated with stunting.

Children age group 36-47 months were about 59% less likely to be stunted than children age 6-11 months(AOR=0.41; 95% (CI=0.22, 0.78).

Another association found in this study result was children those family monthly income 750-1000 birr were 39% less likely to be stunted than children whose family monthly income were less than750 birr (AOR=0.61; 95%CI=0.39, 0.92).

Regarding the association of pre-lacteal feeding with stunting, children who were fed pre-lacteal 1.8 times more likely to be stunted compared to children who were not received by their mothers/care taker(AOR=1.83; 95%CI=1.28, 2.61)

The child born from mothers age of less than 15 years at first birth were 2.4 times more likely to be stunted compared to the counterpart [AOR=2.4; 95%CI=1.19, 5.09].

Table6. Factors associated with stunting among children age 6-59 months at East Belessa Woreda, Northwest Ethiopia 2014(n=633).

Explanatory variable	Stunting		COR(95%CI)	AOR(95%CI)
	Yes	No		
Child age				
6-11	64	43	1	1
12-23	118	60	1.32(.81, 2.17)	1.15(0.63, 2.11)
24-35	90	48	1.26(.75, 2.12)	1.21(0.65, 2.27)
36-47	50	68	0.494(.29, 0.84)**	0.41(0.22, 0.78)**
48-59	43	49	0.59(0.34, 1.04)	0.53(0.27, 1.03)
Family Monthly income				
<750	277	179	1	1
750-1000	66	68	0.62(0.43, 0.92)*	0.61(0.39, 0.92)*
>1000	22	21	0.67(0.36, 1.26)	0.45(0.23, 0.88)*
ANC visit				
yes	94	88	1	
No	271	180	0.709(0.502, 0.99)*	
Total family size				
<5	162	96	1	
>= 5	203	172	1.43(1.03, 1.98)*	
Pre-lactation fluid /food				
Yes	161	156	0.56(0.41, 0.78)***	1.83(1.28, 2.61)***
No	204	112	1	1
Age at first birth				
<15	48	15	3.00(1.53,5.91)**	2.47(1.19,5.09)**
15-19	252	192	1.23(0.82,1.83)	1.12(0.73, 1.73)
20-29	65	61	1	1

Note; *** p<0.001, ** p<0.01 * p<0.05 Backward LR used in multivariate analysis

The result of Bivariate analysis showed that there was significant association between wasting and child sex, Vit. A supplementation, pre-lactation food, frequency of feeding, and HHs that treat water by any means.

Among variables entered in the multivariate analysis, butter as pre-lacteal feeding was the only variable significant association with wasting.

Children who were fed butter as pre-lacteal feeding were about 3 times more likely to be wasted compared to children who received water by their mothers/care taker (AOR=2.12;95%CI=1.82,5.31).

Table7. Factors associated with wasting among children age 6-59 months at East Belessa Woreda, Northwest Ethiopia 2014(n=633).

Explanatory variable	Wasting		COR95%CI	AOR95%CI
	Yes	No		
Child sex				
Male	48	291	0.75(0.49, 0.95)*	
Female	53	241	1	
Vit.A supplement				
Yes	77	352	1	
No	24	180	1.64(1.00, 2.68)*	
Pre-lactation food				
Water	80	45	1	1
Butter	108	139	2.28(1.47, 3.56)**	2.12(1.81, 5.31)**
Frequency feeding				
<3	52	284	0.52(0.29, 0.91)*	
3	20	132	0.43(0.22, 0.84)*	
>3	22	62	1	
water treatment				
Yes	11	93	1	
No	90	439	0.57(0.29, 0.72)	

Note; *** p<0.001, ** p<0.01 * p<0.05 Backward LR used in multivariate analysis

5. Discussion

The prevalence of stunting, and wasting were 57.7 % [95% CI: 50.1-65.2] and16% [95% CI: 10.4-21.6] respectively.

Regarding associated factors of stunting and wasting, multivariate analysis of this study indicated that child age, family monthly income, Child receive pre-lacteal feeds, age of mothers at first birth, and butter as pre-lacteal feeding were found to be significantly associated with Stunting and wasting.

Magnitude of stunting

The finding of this study show that prevalence of chronic malnutrition measured by stunting was consistent with study conducted in Ethiopia by Young Live 50.7% [10], EDHS 2011 in Somali and Amhara region (51%) and (52%) [7] Respectively and Rupandehi District of Nepal 65.1% [26].

The prevalence rates of stunting revealed in this study area were very high WHO Cut-off values for public health significance show that if prevalence of stunting ≥ 40%, stunting in that population was very high [19].

The finding of this study revealed that prevalence of stunting was high compared to study conducted in Gumbrit (24%) [4], Tigray, Ethiopia (46.9%)[5],Addis Ababa 22% [7] and Nirobi Kenya(47%)[13]. The magnitude of stunting obtained, show that it was a public health problem among the study children of East Belesa Woreda. This might be knowledge and awareness of the community towards extra food during pregnancy, exclusive breast feeding, timely complementary feeding and continuation of breastfeeding till two and above years was poor. Evident show that Stunting often starts before birth (in utro) if the mother herself malnourished and cannot pass on enough nutrients to her unborn child. Poor feeding practices, poor food quality, and frequent infections are other causes of stunting [3].

The result of this study revealed that, the prevalence of stunting was higher as compared with a study conducted in Hidabu Abote District, Ethiopia (47.6%) [9] and Beta-Israel children Gondar, Ethiopia (37.2%) [23]. this might be due to first: poor economical status of the population. The study area was food insecure and supported by productive safety net program. It was evident that stunting in food insecure area was high in Kailali District of Nepal [22].second: poor health service delivery exposes children for recurrent infection and leads to the child stunted. Third: study area: the area was not comfortable for agricultural crop production like vegetable, fruit and cereals.
This might be the possible explanation for the difference between the two findings.

Evidence shows that the prevalence of stunting in Ethiopia was high and the Amhara region had a stunting proportion more than the national average (52% for Amhara and 44% for the whole nation). This finding of this result revealed that, the proportion of stunting in the East Belessa Woreda population was higher than the national stunted children. Stunting normally reflects failure to receive adequate nutrition over a long period of time and is also affected by recurrent infection [7].

The finding of this study showed that prevalence of stunting was higher as compared with study conducted in Gojam, Ethiopia 43.2% [25]. This variation of stunting might be due to different factors like socioeconomic, poor health service delivery, sample size and study subjects as compared with present study. Even if the woreda was supported by social safety net program more than nine years, it might not address the target population due to poor management and poor resource allocation.

The result of this study revealed that the prevalence of stunting was lower than study done in Afar region, Ethiopia (67.8%) [6]. and an urban slum of Ludhiana (74%) [21]. this variation might be one: agro-pastoral nature of households, the life style of agro-pastoral population hadn’t permanent settlement. This might cause the child inappropriate and lack of adequate feeding. Socioeconomic difference between the two populations and study period.

Prevalence of stunting in this finding was higher compared to study done in Nigeria, 44.9% [17], Chitwan district of Nepal 37.3% [20]. This might be difference also due to study period, socioeconomic characteristics, health service delivery and study area.

The result of this study shows that prevalence of stunting was higher than research done in the respective countries by Young Lives in Bangladesh (47.1%), and Vietnam (20.7%) [10]

Magnitude of Wasting

The prevalence rate of wasting in this study revealed that children in the study area were in critical condition WHO Cut-off values for public health significance show that if prevalence of wasting ≥ 15% , children in that population was critical condition. Whereas if it was < 5% acceptable [19]. Wasting in children is a symptom of acute Undernutrition, usually as a consequence of insufficient food intake or a high incidence of infectious diseases [33].

The prevalence of wasting in this area was consistent with study done in Oromia, Ethiopia 16.8% [9], four zones of tigray, Ethiopia 11.6% [5], Gumbrit 17.7%[4], Gojam, Ethiopia 14.8% [25], Afar region, Ethiopia 12.8% [6].and Bangladesh 19.1% [10].

The finding of this study show that prevalence of wasting was higher than study conducted in Beta-Israel children Gondar, Ethiopia 4.9% [23], Nairobi Kenya 2.6% [13] and Northern Nigeria 3.7% [17]. This might be due to in adequate intake of nutritive food and infectious disease. Evident show that wasting in children was a symptom of acute Undernutrition, usually as a consequence of insufficient food intake or a high incidence of infectious diseases [2, 19].

The result of this study shows that prevalence of wasting was higher than research done in the respective countries by Young Lives, in Ethiopia (5.9%) and Vietnam (5%) [10].

The finding of this study show that Wasting was lower than study conducted in EDHS Somali region Ethiopia 22% [7], pastoral community of Dollo Ado district, Somali region, Ethiopia 42.3% [14], urban slum of Ludhiana 42% [21] and Chitwan district of Nepal (25.7%) [20]. this might be be due to study area, study period and socioeconomic status.

Associated factors for Stunting, multivariate analysis of this study indicated that child age, family monthly income, Child receive pre-lacteal feeds, age of mothers at first birth, were found to be significantly associated with Stunting.

Current study finding revealed that, family monthly income inversely associated with stunting. This result was consistent with study conducted in Hidabu Abote district, Ethiopia [9]. As the family income was increased, the level of chronic malnutrition (stunting) among children aged 6-59 months also decreased.
Present study indicate that children from whose family monthly income 750-1000birr were 39% less likely affected by stunting as compared to children whose family monthly income were less than750 birr (AOR=0.61; 95%CI=0.39, 0.92).

Finding of this study was in line with the study conducted in Gumbrit, Ethiopia [4] and Somali [14]. In which family/household income was significantly associated with nutritional status of the under five children. Children belonging to the low-income group were at a higher risk of being wasted and stunted than children of better income families. Although the economic differentials seem to be silent in rural society it appears to be an important predictor of childhood nutritional status. Low income levels of developing nation limits the kinds and the amounts of food available for consumption. Low income also increases the likelihood of infection through such mechanisms as inadequate personal and environmental hygiene. The new Series in The Lancet shows that Undernutrition (stunting) contributes to the deaths of about 3 million children each year, 45% of the total. It results stunted the physical growth and life chances of millions of people, and for Africa and Asia estimates suggest that up to 11% of national economic productivity is lost due to Undernutrition[1].

However finding of this study was not in agreement with the study finding In Gojam, Ethiopia [25] and Ludhiana [21].which family monthly income was not associated with stunting. This discrepancy may be due to difference in economic status. The economic differential in rural society appears to be an important predictor of childhood stunting.

As represented in figure 5 younger children (12 months to 35 months old) were found to be more stunted than the other age groups. This finding was in line with study done in Gumbrit and Bete-isreal [4, 23]. and the highest prevalence was in those 12–23 months old. Yet the lowest in children aged 48-59 months. This finding was in line with study done in Ethiopia [25] and other developing countries [21]. The result of the study highlights the first 12-35 months of life was the most critical period for intervention suggesting an urgent need to institute programs which improve the nutritional status of most vulnerable children in the study area. Children younger than 24 months of age responded much more rapidly to the improvement than older children. After a child reaches 2 years of age, it is very difficult to reverse stunting that has occurred earlier.
Children age group 36-47 months were about 59% less likely to be stunted than children age 6-11 months(AOR=0.41; 95% (CI=0.22, 0.78).

Pre-lacteal feeding was also inversely related to stunting. Children who received pre-lacteal feeding were found to be at significantly higher risk of stunting than children who did not receive. It was noticed that children who received pre-lacteal feeding were 1.8 times more likely to be stunted than children who did not receive pre-lacteal feeding at the time of birth by their mothers/care taker or birth attendants (AOR=1.83; 95%CI=1.28, 2.61).
The study finding was consistent with study done in food surplus region Ethiopia [25].In which pre-lacteal feeding was significantly associated with stunting. However finding of this study was not in agreement with the study finding In Gumbrit, Ethiopia [4], Bete-Israel [23] and Nepal [20].This might be due to poor awareness about traditional pre-lacteal feeding. This bad tradition exposed the child for stunting (irreversible health problem). It was due to a chronic lack of nutrients during a child's first 1,000 days, from conception to their second birthday [2].

The child born from mothers age of less than 15 years at first birth were 2.4 times more likely to be stunted compared to the child born from mothers gave first birth at the age of 20-29 years (AOR=2.4; 95%CI=1.19, 5.09).

This study finding was not in line with study conducted in Bête-Israel Ethiopia, Kenya, Nigeria and Nepal [23, 13, 17, 20]. This might be due to lack of awareness towards the risk mothers gave first birth before fifteen in the child as well as the mother.

In this study the median age at first birth for all women age14-25 was 18.where as in the EDHS 2011show that from all women was 19.2. Women living in urban areas have their first birth slightly later than women living in rural areas. Age at first birth increases with education and wealth. Women with no education have their first birth at a median age of 18.8, compared with 24.1 among women with secondary or higher education [7].

Associated factors for wasting,

This study finding show that children received butter as pre-lacteal feeding was positively associated with the occurrences of wasting. Children who were received butter as pre-lacteal feeding was 2 times more likely affected by wasting as compared to those who were received water (AOR=2.12;95%CI=1.82,5.31).

The study finding was consistent with study conducted in Somali region, Ethiopia [14].In which pre-lacteal feeding was significantly associated with wasting. However finding of this study was not in agreement with the study finding In Gumbrit Ethiopia [4] and Nepal [23].This might be due to poor awareness about traditionally pre-lacteal feeding in the study area.

This study finding revealed that educational status was not significantly associated with both stunting and wasting. However study done in pastoral communities of Somali region, Ethiopia [14] show that there was significant association between maternal education and wasting. Education is one of the most important resources that enable women to provide appropriate care for their children. Educated women was believed to exert an impact on health and nutritional status of children since it provides the mother with the necessary skills for child care, increase awareness of nutritional needs and preference of modern health facilities as well as change of traditional beliefs about diseases causation, and use of contraceptives for birth spacing.

6. Limitation of the study

The factors expected to influence stunting and wasting may not be exhaustive. There could be other influencing factors which this study did not reveal like maternal BMI and birth weight.

Qualitative aspects of data were not included in this study to explore some associated factors and to triangulate the finding of the quantitative study through qualitative data.

As the study was questionnaire-based, questions that required a good memory were vulnerable to recall bias.

7. Conclusions and Recommendations

7.1 Conclusions

The finding revealed that, prevalence of stunting and wasting was high (57.7% and 16%) in East Belesa Woreda.

In multivariate analysis, child age, family monthly income and age of mother at first birth, pre lacteal feeding was significantly associated with stunting. Children who received butter as per lacteal feeding were significantly associated with wasting.

7.2. Recommendations

To Regional health bureau and Zonal Health department

- ✓ Income generation activities should establish like saving at household level, skill training on non agricultural activities and credit scheme for purchasing small animals to improve family income.
- ✓ Special programs for nutritional support to prevent stunting and wasting in the study area.

To health office and concerned NGOs

- ✓ Strengthening nutrition and health education programs using appropriate IEC material to prevent birth before fifteen years.
- ✓ Nutrition surveillance needs to be done continuously and special attention should be given to stunted and wasted children
- ✓ Community based nutrition program should be strengthened to tackle the problem of stunting and wasting at community level depending on the severity of stunting and wasting identified in this study.
- ✓ Improve the educational status of mothers who give first birth below the age fifteen years by using adult learning programmes.
- ✓ Nutrition education by health extension workers should be strengthening to improving the feeding practice of parents on appropriate children feeding.
- ✓ Woreda health office should be collaborated with others sectors and stake holders to prevent pre-lacteal feeding by empowering women.

To the community at large:

- ✓ Use of family planning to be encouraged to avoid birth before fifteen years of age at community level.
- ✓ Continued attention should be mandatory to avoid traditionally giving butter as pre-lacteal feeding by rural community.

To researchers:

- ✓ Further study should be done to see other an explored associated factors that were not included in the present study with Qualitative study design.

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9. ANNEX

Annex 1: Questionnaire

University of Gondar

College of Medicine and Health Sciences

Institute of Public Health

A questionnaire prepared to assess nutritional status and associated factors among children age 6-59 months old.

INTRODUCTION AND CONSENT

Dear participant; my name is _____. I am working as a data collector with Wagaye Fentahun, who is doing a research as partial fulfillment for the requirement of Master of public health at University of Gondar.

The main aim of his study is to assess nutritional status and associated factors among children aged 6-59 months. The results of the study will be used as baseline information to design appropriate intervention strategies. Your name will not be written in this form and the information you give is kept confidential. If you do not want to answer all or some of the questions, you do have the right to refuse. So you are kindly requested to provide your genuine answers to the questions.. If you have any question, don't hesitate to ask the interviewer. It doesn't take more than 25 minutes.

Would you participate in responding to the questions in this questionnaire?

Yes --------No------

Name and Signature of the data collector _____

Date of interview_____

Name and signature of the supervisor _____

Date_____

Keble Administration ----------

Questionnaire No_____

Date of Interview___/___/2006 E.C.

Interviewer Code_____

Instructions:

Fill in the blank space.

Circle the appropriate answer.

Do not omit any item of information

PART ONE: SOCIO-ECONOMIC AND DEMOGRAPHIC VARIABLES			
No_	**Question**	**Response**	Skip to/remark
101	Head of the HH	1. Male 2. Female	
102	Marital status	1. Married 2. Single 3. Divorced 4. Widowed	
103	What is your religion?	1.ortodox 2.muslim 3.protestant 99.other	
104	Ethnicity	1. Amhara 2. Tigre 3.Agew 99. Others	
105	Total family size (How many person live in the HH?)	In number_____	
106	How many children 6-59 month live in the HH	In number_____	
107	Maternal education	1.Can't read and write 2.Can read and write(Informal education) 3.Primary education 4.Secondary education 5.Higher	
108	Paternal education	1.Can't read and write 2.Can read and write(Informal education) 3.Primary education 4.Secondary education 5.Higher	
109	Occupation of mother (More than one answer is possible)	1. Housewife only 2. student	

		3. Merchant/Trade 4. Government employee 99. Other (specify)	
110	Occupation of husband (More than one answer is possible)	1. Farmer 2.student 3.Merchant/Trade 4.Government employee 99. Other (specify)	
111	Monthly income of the HH	_____ Birr	
112	Who decides how the money you earn will be used?	1. Mainly spouse 2. Mainly husband 3. Only husband 4. Both jointly	
113	Do you have livestock, herd or farm animal?	1. Yes 2. No	
114	How many agricultural lands do you have?	1. Do not have 2. _____(local unit) (Timad) 99. Do not know/not sure	
115	Services fulfilled in the HH?	1.electricity 2.phone 3.television 4.radio	
116	Does the HH supported by safety net program	1.yes 2.no	
117	If yes, how long?	----------year	
118	Where do you gate the main food source for the HH?	1.Own production 2. Purchasing. 3.safety net 99.other	

PART TWO: CHILD CHARACTERSTICS

201	Child's sex	1. Male 2. Female	
202	Child's age	_____ Months	
203	Place of delivery	1.Home 2.Health institution 99. Other (specify)	
204	Gestational age at birth	1. Less than 9 Months 2. At 9 months 3. Greater than 9 Month 99. Do't know/Not sure	
205	Did you have plan (want) to give birth of the child?	1. Yes 2. No	
206	Does the child ever been immunized?	1. Yes 2. No	If no, skip to 212
207	Vaccines received (See card, if no card available ask them to recall) (More than one answer is possible)	1. BCG only (See Scar) 2. DPT (No of dose____) 3. Measles 4. No card found	

208	Vit. A supplementation in the past six months? (show capsule)	1. Yes 2. No 99. Don't know/not sure	
209	Which illness affects the child in the last two weeks	1. Diarrhea 2. Fever 3.ARI	
210	If there is diarrhea, how frequent in a year	1. One episode 2. Two episode 3. 3-4 episode 4. >5 episode	
211	Is the child affected by measles in the last 3 month ?	1.yes 2.no	
212	Presence of oedema on the child (check)	1. Yes 2. No	

PART THREE: CHILD CARING PRACTICE AND MATERNAL CHARACTERSTICS			
301	Did you ever breast fed the child?	1. Yes 2. No	If yes, skip to 303
302	If no, reason for not breastfeeding?	Reason_____	
303	When did you first put the child on breastfeeding?	1. Immediately(if <1 Hr) 2. _____Hrs (If less than 24hours record hour) 3. __ Days 99. Don't know/not sure/	
304	Did you give the child pre-lactation Food/fluid?	1. Yes 2. No	If no, skip to 306
305	If yes, what did you gave him (her)?	1. Water 2. Butter 99. other (Specify)	
306	Did you squeeze out and throw the first milk?	1. Yes 2. No 99.don't know	
307	Are you still breastfeed?	1. Yes 2. No	
308	How many times in the last 24 hours you Breast fed?	_____ Times	
309	Do you breast feed in the night?	1. Yes 2. No	
310	Did you give the child additional food or fluid other than breast milk in the past 24 hours?	1. Yes 2. No	
311	If yes what you give?	----------	

312	At what age did you start feeding other Additional food?	_____ Months	
313	What do you use to feed the child	1. Bottle 2. Cup 3. Spoon 99. Other (specify)	
314	How many months did you breastfeed the child?	_____ Months 99. Don't know/not sure/	
315	Who is usually taking care of the baby feeding?	1. Mother 2. Sister 3. House maid 99. Other (specify)	
316	If child was sick, where did you take him or her for treatment?	1. Did not take 2. Taking to traditional healers 3. Taking to Health institution 99. Other (Specify)	
317	**Mother's** age in years	--------completed Year	
318	Age at first birth	_____ Years	
319	What was the age of the youngest child when this child born in month	_____ months	

320	Total number of children ever born?	In number _____	
321	During pregnancy or lactation, did you consume extra food? (the child under the study)	1. Yes 2. No	
322	Did you visited health facility for ANC during pregnancy	1. Yes 2. No	
323	If yes, How many times?(number of visit)	_____ times	
324	Have you ever used family planning methods	1. Yes 2. No	If no, skip to 326
325	Which method have you ever used? (More than one answer is possible)	1. Pills 2. Depo-Provera 3. Norplant 4. condom 99. other (Specify	
326	Do you use it now?	1. Yes 2. No	
327	When do you usually wash your hands? (More than one answer is possible)	1. After latrine use 2. Before preparing food 3. Before serving food 4. After cleaning child faeces 99. Other (specify)	
328	How do you wash your hand?	1. Using water only 2. Using soap always 3. Using soap some times 4. Using ash some times	
PART FOUR: ENVIRONMENTAL CONDITIONS			
401	What is your main source of drinking water?	1. River 2. Un protected spring. 3. Protected spring. 4. Public tap 99. Other (specify)	
402	Amount of water used in the HH daily?	In liters_____	
403	How long does it take to fetch water? you go and come back	In minutes_____	
404	Do you treat water in any way to make it safer?	1. Yes (Specify) 2. No	
405	Do you have latrine?	1. Yes 2. No	If no, skip to 407
406	Type of latrine you use? (Observation)	----------	
407	How do you dispose garbage?	1. Open field disposal. 2. high land area	

		3. in river 4. Composting 5. Burning 99. Other (specify	
408	Type of House (Observation)	1. Corrugated Iron Sheet 2. thatched 99. Other(Specify)	
409	Do you have separate room for livestock?	1. Yes 2. No	

Anthropometrical measurement

Child weight in kilogram_____

Child height/length in centimeters_____

የአማርኛ መጠይቅ

በጎንደር ዩኒቨርሲቲ ፣ በህክምና እና ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ ኢንስቲትዩት የምግብ እና የአመጋገብ ሁኔታ እና ተዛማጅ ጉዳዬች ዙሪያ ዕድሜቸው ከ6-59 የሆኑ ህፃናትን አስመልክቶ የተዘጋጀ መጠይቅ

መግቢያ

ሠላም እንደምን አሉ? ስሜ_____ እባላለሁ::ከዚህ የመጣሁት ይህንን ጥናት የሚያካሂደው የጎንደር ዩንቨርስቲ የህ/ሰብ ጤና ሳይንስ ተማሪ የሆኑት የአቶ ዋጋየ ፈንታሁን ጥናት ቡድን አባል ሆኜ ነው::ከዚህ በመቀጠል ዕድሜቸው ከ6-59 የሆኑ ህፃናት ላይ የስነ ምግብ እና የአመጋገብ ሁኔታ/ችግር እና ተዛማጅ ጉዳዬቹን በተመለከተ የተወሰኑ ጥያቄወችን እና ልኬታዎችን ማካሄድ ነዉ::የዚህ ምርምር ውጤት ያለውን የአመጋገብ ሁኔታ(ችግር) ከማሳየቱ በተጨማሪ ችግሩን ለመፍታት ትልቅ ዕገዛ ይኖረዋል :: ለምንጠይቅወት ጥያቄዎች የዕርስዎ ትክክለኛ መልስ በጣም አስፈላጊ ነው :: በጥያቄዎች ዙሪያ ጥርጣሬ ካደረብዎት ጠያቂውን እንደገና መጠየቅ ይችላሉ:: ከእርስዎ የምናገኘውን ማንኛውንም መልስ በሚስጥር እንጠብቃለን ከዚህ ጥናት ጋር በተያያዘ በማንኛውም ቦታ እና ጊዜ ስምዎ እንዳይመዘገብና እንደማይጠቀስዎ ልንገልፅልዎ እንወዳለን ::

ለጥናቱ የምናሳትፍዎ የእርስዎ ሙሉ ፈቃደኝነት ስናገኝ ብቻ ነው፡፡ በመጠይቁ ያለመሳተፍ ወይም በመጠየቁ ሂደት ሊመልሱት የማይፈልጉትን ጥያቄ ያለመመለስ መብትዎ የተጠበቀ ነው፡፡

መጠይቁ ከ25 ደቂቃ በላይ አይፈጅም::

በመጠይቁ ስመሳተፍ ፈቃደኛ ነዎት?

1. **አዎ ፈቃደኛ ነኝ መጠይቁ ይቀጥላል::**
2. **የለም ፈቃደኛ አይደለሁም ወደ ሴሳ ተሳታፊ ቤት መሸጋገር**

የመረጃ ሰብሳቢው ስም ---------- ፊርማ ----------

መጠይቁ የተሞላበት ቀን ----------የተቆጣጣሪው ስም ----------

ለትብብርዎ በጣም እናመሰግናለን ::

ክፍል አንድ ፤ ማህበራዊና ኢኮኖሚያዊ ሁኔታ መጠይቆች			
101	የቤተሰቡ ሃላፊ ማነዉ?	1.ወንድ 2. ሴት	
102	የትዳርዎ ሁኔታ?	1.ያገባች 2. ያላገባች 3. የፈታች 4. የሞተባት	
103	ሃይማኖትዎ ምንድን ነው ?	1.ኦርቶዶክስ 2.ሙስሊም 3.ፕሮቴስታንት 99.ሌላ------	
104	ብሄርዎ ምንድን ነው ?	1. አማራ 2.ትግሬ 3.አገዉ 99.ሌላ----	
105	በቤት ውስጥ የሚኖሩ የቤተሰብ አባላት ቁጥር ምን ያህል ነው ?	በቁጥር……..	
106	እድሜያቸዉ ከ6-59 ወር የሆኑ ሕፃናት ብዛት	በቁጥር……..	
107	የናት የትምህርት ደረጃ	1.ማንበብ መፃፍ የማትችል .2. ማንበብ መፃፍ(መሰረተ ት/ት) 3. 1ናኛደረጃ (1-8) 4. የሁለተኛ ደረጃ ትምህርት(9-12) 5. ከፍተኛ ደረጃ(ሙያናቴክኒክ/ኮሌጅ ዩኒቨርሲቲ)	
108	ያባት የትምህርት ደረጃ	1. ማንበብ መፃፍ የማይችል 2. ማንበብ መፃፍ(መሰረተ ት/ት) 3. የመጀመሪያ ደረጃ ትምህርት(1-8) 4. የሁለተኛ ደረጃ ትምህርት(9-12) 5. ሶስተኛ ደረጃ(ሙያናቴክኒክ/ኮሌጅ ዩኒቨርሲቲ)	
109	የህፃኑ እናት ዋና የስራ ዓይነት ምንድን ነዉ?	1.የቤት እመቤት 2. ተማሪ 3.የንግድ 4.የመንግስት ሰራተኛ 99.ሌላ ካለ ይጠቀሰ	
110	የህፃኑ አባት ዋና የስራ ዓይነት ምንድን ነዉ?	1.ግብርና 2.የንግድ ስራ 3.መንግስት ሰራተኛ 99.ሌላ ካለ ይጠቀሰ	
111	ወርሀዊ ገቢዎ ስንት ነው?	----------ብር	
112	ገንዘቡን በበላዩነት የሚያዝ ማነዉ?	1.በዋናነት ሚስት 2.በዋናነት ባል 3.ባል ብቻ 4.በጋራ በመመካከር	
113	የርቢ እንስሳት ዎዬም የእርሻ ከብት አለዎት	1. አዎ 2. የለም	ከሌለ ወደ ቁ113
114	ለቤተሰበዎ ምን ያህል የእርሻ መሬት አለዎት ?	1.የለኝም 2. ……ጥማድ 99.አላዉቀዉም	
115	በመኖሪያ ቤታቸዉ የተሟሉ አገልግሎቶች(ካንድ በላይ ይቻላል)	1.መብራት 2..ስልክ 3.ቴሌቪዥን 4.ሬድዮ	
116	ቤተሰቡ በምግብ ዋስትና/ሴፍቲኔት ታቅፏል	1.አወ ታቅፏ 2.የለም	
117	ከታቀፈ ለስንት አመት	----------ዓመት	
118	በዋናነት የቤትዎ የምግብ ምንጭ ከምን ይገናል?	1.ከእራስ ምርት 2.ከግዥ 3.ከምግብ እርዳታ 96.ሌላ ካለ ይግለፁ	
ክፍል ሁለት፡ ህጻንን የሚመለከቱ መረጃዎች			
201	የህጻኑ/ኗ ጾታ	1.ወንድ 2.ሴት	
202	የህጻኑ/ኗ እድሜ	……ወር	

203	የተወለደበት/ችበት ቦታ	1.ቤት 2.ጤና ተቋም 99.ሌላ ካለ ይብራራ	
204	ህፃኑ/ኗ/ በስንት ወር ነው የተወለደው	1.ከ9 ወር በታች/ሳይሞላዉ 2. 9 ወር ላይ 3.ከ9 ወር በላይ 99.አላውቀውም	
205	ለመውለድ እቅድ ነበረሽ	1.አዎ 2. የለኝም/አልነበረኝም/	
206	ተከትባ /ቦ/ ያውቃል/ለች/ አንዴም ቢሆን	1. አዎ/ ተከትቧል 2.አልተከተበም	
207	የተሰጠው ክትባት /ካርድ ይታይ/ ከሌለ በማስታወስ /ከአንድ በላይ\ መልስ ይቻላል/	1.ቢሲጅ ብቻ /ለምጥ ይታይ/ 2.ዲፒቲ /መጠን 3.አለሞቸ /የሚዝል/ ክትባት 4.ካርድ የለም	
208	ባለፈው 6 ወር ውስጥ ቫይታሚን ኤ ወስዷል /ለች/	1.አዎ 2.የለም 99.አላውቀውም/አላስታውስም/	
209	ባለፈው 2 ሣምንት ምን አሞት/አሚት/ ነበር	1.ተቅማጥ 2.ትኩሳት 3. ሳል.	
210	ተቅማት ከነበር፣በዓመት ምን ያህል ጊዜ ተከሰተ	1.አንድ ጊዜ 2 ሁለት ጊዜ 3.ከ3-4 4. ≥ 5	
211	ባለፉት 12 ወራት ኩፍኝ/አለሞቸ ታሞ/ማ ነበር	1.አወ2.የለም	
212	እብጠት /የ2 እግር/ አለው /አላት/ (ያረጋግጡ ይታይ)	1.አዎ 2 . የለ	

ክፍል ሶስት፤የህፃትና እናቶች እንክብካቤና ልማዶችን በተመለከተ፡-

301	ህፃኑ/ኗ ጡት ጠብቶ/ታያዉቃል/ታዉቃለች?	1.አዎ 2. የለም	አዎ ከሆነ ወደ ቁ303
302	መልሰዎ የለም ከሆነ , በምን ምክንያት ጡት ሳይጠባ ቀረ/ች?	1.እናቲቱ ስላመማች/ደካማ ስለሆነች 2.ሕፃኑ/ኗ ስላመመዉ/ማት 3.የእናቲቱ ጡት ችግር 4.በቂ ያለሆነ የእናት ወተት 5.እናቲቱ ስራ ላይ ስለሆነች 99.ሌላ ካለ ይገለፅ	
303	ህፃኑ እንደተወለደ ጡት የሰጡት መቼ ነዉ ?	1.ወዲዉኑ(በ1 ሰዓት ዉስጥ) 2.ከ1-24 ሰዓት ዉስጥ 3.ከ 24 ሰዓት በኋላ 99.አላስታዉስም	
304	ሕፃኑ/ኗ እንደተወለደ/ች ከእናት ወተት ዉጭ ሌላ እሚጠጣነገር ሰጥተዋታል/ታል? (አቃምሰዉታል)	1.አዎ 2. የለም	
305	መልሰዎ አዎ ከሆነ በምን እንዳቃመሱት/ት ይጥቀሱ (ከአንድ በላይ መልስ ሊሰጥ ይችላል).	1.ንፁህ ዉሃ 2 .ቅቤ 3.ብቅል 99.ሌላ ካለ ይገለፅ	
306	እንደወለዱ የሚገኘዉን የእናት ወተት)(እንገር) ታልቦ ተደፋ?	1.አዎ 2.የለም 99. አላስታዉስም	
307	ልጅዎን እስካሁን ድረስ የእናት ጡት ወተት አያጠቡትነዉ?	1.አዎ.2.የለም	
308	ባለፉት 24 ሰዓት ዉስጥ ምን ያህል ጊዜ አጠቡት	----------ጊዜ	
309	ሌሊት ያጠባሉ?	1.አዎ 2.የለም	
310	ተጨማሪ ምግብ/ፈሳሽ ባለፉት 24 ሰዓታት ሰጥተዉታል?	1.አወ 2.የለም	
311	• መልሰወ አወ ከሆነ ምን ሰጡት	----------	

312	ስንት ወር ሲሆናት የመጀመሪያ ፈሳሽ ወይም ምግብ ያገኘዉ/ችዉ?	ወራት_____ _____	
313	ለመመገብ የሚጠቀሙት ምንድን ነዉ	1.ጡጦ 2.ኩባያ 3.ማንኪያ 99.ሌላ(ይብራራ)……..	
314	ምን ያህል ወር ጡት አጠቡ	…….ወር 99.አላዉቀዉም	
315	ሕፃኑን በመመገብ የሚንከባከብ የቤተሰብ አባል ?	1.እናት 2.እህት 3.የቤት ሰራተ 96.ሌላ ይብራራ	
316	ህጻአኑን/ኗ ሲያመዉ/ማት የት ይዎሰዳሉ	1.የቤት ዉስት ህክምና 2. የባህል ህክምና 3. ጤና ተቋም 99.ሌላ ይብራራ	
317	የእናት እድሜ ስንት ዓመት ነዉ	…….ዓመት	
318	የመጀመርያ ልጅቨን ስትወልጅ እድሜቨ ስንት ነበር	……ዓመት	
319	በጥናቱ የሚሳተፈዉ ታላቅ ስንት አመቱ/ት/ ነው	---------- ዓመት	
320	ጠቅላላ የወለድሻቸዉ ልጆች ስንት ናቸው	በቁጥር----------	
321	በጥናቱ የሚሳተፈውን ልጅ ነብሰ-ጡር/እያጠቡ እያለ ተጨማሪ ምግብ ይወስዱ ነበር	1 አዎ 2 የለም	
322	በእርግዝና ወቅት በጤና ተቋም ክትትል ।ያደርጉ ነበር	1 አዎ 2. የለም	
323	ካደረጉ ምን ያህል ጊዜ	---------- ጊዜ	
324	የቤተሰብ ምጣኔ አገልግሎት ይጠቀሙ ነበር	1 አዎ 2 የለም	
325	ከተጠቀሙ የትኛውን ዘዴ /ከአንድ በላይ መልስ ይቻላል/	1 ክኒን 2 መርፌ 3 ክንድ ላይ የሚቀበር 99. ሌላ ….	
326	አሁን ይጠቀማሉ	1 አዎ 2. የለም	
327	እጅሽን መቼ መቸ ትታጠቢያለሽ /ከአንድ በላይ መልስ ይቻላል/	1 ከሽንት ቤት መልስ 2 ምግብ ከማዘጋጀት በፊት 3 ምግብ በማቀርብበትና ከመመገቤ በፊት 4 ህፃን ካፀዳዳሁ በኋላ 99. ሌላ ካለ ይብራራ	
328	በምን ነው እጅሽን የምትታጠቢው	1 በውሀ ብቻ 2 በሳሙና ብቻ 3 አልፎ አልፎ በሳሙና 4 በአመድ	
ክፍል አራት፡- ንጽህናን እንዲሁም የዉሃ አቅርቦትን በተመለከተ የከረቡ መጠይቆች			
401	ለቤተሰብዎ የመጠጥ ውሃ ከየት ያገኛሉ?	1.ከወንዝ 2.ያልታጠረ የጉድጓድ ዉሀ 3.የታጠረ የጉድጓድ ዉሃ 4.የጋራ ቦኖ 99 ሌላ ይበራራ	
402	በቀን የቤት ውስጥ የዉሃ ፍጆታችሁ ምን ያህል ነዉ	---------- ሊትር	
403	ውሃ ለመቅዳት ምን ያህል ጊዜ ይወስዳል(ደርሶ መልስ)?	በደቂቃ----------	
404	ዉሃ ንፅህናዉ የተጠበቀ እና ለጤና ተስማሚ እንዲሆን ያክሙታል ዎይ?*(የዉሃ እቃ ማጠብ የሚለዉን አያካትትም)*	1.አዎ,(ይብራራ) 2.የለም	
405	መፀዳጃ ቤት አለዎት	1.አዎ 2.የለንም	
406	መልስዎ አዎ ከሆነ ምን አይነት ነው?(ይታይ)	----------	
407	ቆሻሻ የሚያስወግዱት የት ነው ?	1.ግቢ ውስጥ 2. ክፍታ ቦታፈልገው 3.ወንዝ ላይ 4.መቅበር 5.ማቃጠል	
408	የመኖሪያ ቤትዎ አይነት?	1.ቆርቆሮ 2.ሳር 99.ሌላ	
409	ለቤት እንሰሳት የተለየ ማደርያ አለ?	1.አዎ 2. የለም	
በጥናቱ የተካተቱትን ሕፃናት ቁመት/እርዝመት እና ክብደት			

የሕፃኑ/ኗ እድሜ ክብደት፡ ርዝመት		----------ዓመት ----------ኪሎ ግራም ------ ሴንቲ ሜትር	
	ህፃኑ የእግር እብጠት አለዉ ወይ?	1. አዎ 2.የለም	
	የልኬታዉ ሁኔታ	1.ተለክቷል 2.አልነበረም 3.ለመለካት ፈቃደኛ አለመሆን 99.ሌላ ካለ ይገለፅ	

ለሰጡኝ መልስ እና ላደረጉልኝ ትብብር በጣም አመሰግናለሁ!!!

Declaration

I, the undersigned, MPH student declare that this research proposal is my original work in partial fulfillment of the requirement for the degree of Master in public health.

Name: wagaye Fentahun

Signature: _____

Place of submission: Institution of public Health, College of Medicine and Health Sciences, University of Gondar.

Date of Submission: _____

This research proposal work has been submitted for examination with our approval as university advisor(s).

Advisors name	**Signature**
1. Dr. Mamo Wubshet (PhD)	_____
2. Mr. Amare Tariku (MSc)	_____